ANNALEN DER PHYSIK

Gegründet 1790 durch F. A. C. Gren

Fortgeführt durch L. W. Gilbert, J. C. Poggendorff,

G. u. E. Wiedemann, P. Drude, W. Wien, M. Planck,

E. Grüneisen, F. Möglich, H. Koplermann, G. Richter

Kuratorium:

F. Hund, B. Kockel,

A. Lösche, G. Ludwig, W. Paul,

R. Rompe, E. Schmutzer, G. Vojta

Redaktion:

H.-J. Treder und W. Walcher

CAPUTH MARBURG/L.

ISSN 0003–3804
Ann. Physik
Leipzig 44 (1987)
S. 1–636

7. Folge, Band 44. Mit 153 Abbildungen im Text

Der ganzen Reihe 499. Band

1 9 8 7

JOHANN AMBROSIUS BARTH LEIPZIG

Contents

S. Antoci, Pavia (Italy): A Rule for the Equilibrium of Forces in the Hermitian Theory of Relativity 127
S. Antoci, Pavia (Italy): A Method for Finding Solutions of the Hermitian Theory of Relativity which Depend on Three Coordinates 297
A. Arnz and H.-E. Ponath, Jena: Scattering of Electromagnetic Bulk Waves from Rough Surfaces with Anisotropic Autocorrelation Function. With 2 Figures 493
G. S. Asanov, Moscow (USSR): Gauge Fields in General Parametrical Approach and Their Finslerian Reduction 1
J. Audretsch and C. Lämmerzahl, Konstanz (FRG): Neutron Interference: Influence of the Mirror on the Spin 145
F. Baumann, B. Heinritz, M. Ringpfeil, Leipzig: Relationship between Thermodynamic Efficiency and Rate of Microbial Growth Aimed at Optimization of Microbial Growth. With 2 Figures 300
U. Bleyer and D.-E. Liebscher, Potsdam-Babelsberg: Kaluza-Klein Cosmology: Friedmann Models with Phenomenological Matter 81
J. Blümlein, Greifswald: On the D.C.-Limit of the Electric Conductivity of Plasmas. With 3 Figures 524
J. Blümlein and W. D. Kraeft, Greifswald: On Self Energy and Vertex Corrections to the Electrical Conductivity of Plasmas. With 4 Figures 461
M. Bordag and L. Kaschluhn, Dubna (USSR) and Leipzig: On the Light-Cone Expansion in Gauge Field Theories (QED) 265
Th. Braunschweig, B. Geyer and D. Robaschik, Leipzig: Anomalous Dimensions of Flavour Singlet Light-cone Operators 403
R. Burghardt, Brunn/Geb. (Austria): Covariant Principle of Variation in the Theory of Gravitation 340
A. Roy Chowdhury and S. Sasmal, Calcutta (India): On the Bilinearisation Approach to the Soliton Solutions of Cylindrical and Nonlocal K-P Equation 619
L. Diósi and B. Lukács, Budapest (Hungary): In Favor of a Newtonian Quantum Gravity .. 488
H. Eichhorn, Jena: Description of Pulse Propagation in Optical Strip Waveguides by the Generalized Nonlinear Schrödinger Equation. With 1 Figure 120
H. Eichhorn, Jena: Bäcklund Transformation and N-Soliton Solution for the Generalized Nonlinear Schrödinger Equation 261
F. El-Kabbany, Y. Badr, G. Said, S. Taha and S. Mahrous, Cairo (Egypt): A Study of the Thermal Hysteresis in $AgNO_3$. With 7 Figures 575
Th. M. El-Sherbini, A. A. Farrag, H. M. Mansour, A. A. Rahman, Trieste (Italy) and Cairo (A. R. Egypt): Electric Dipole Oscillator Strengths and Radiative Lifetimes in the Boron Isoelectronic Sequence. With 2 Figures 412
Th. M. El-Sherbini, H. M. Mansour, A. A. Farrag and A. A. Rahman, Trieste (Italy) and Cairo (A. R. Egypt): Hartree-Fock Energies of the Doubly Excited States of the Boron Isoelectronic Sequence 419
P. Enders, Berlin: A Class of Solutions of Non-Linear Evolution Equations with Diffusion .. 514
H. Engel-Herbert and M. Schumann, Berlin: Entropy Decrease during Excitation of Sustained Oscillations. With 8 Figures 393
E. Förster, K. Goetz, D. Zimmer, P. Glas, A. Goetsch, R. Koch, M. Naumann, P. V. Nickles, M. Schnurer and I. Will, Berlin: Investigated of X-Ray Emission from Plasmas Created by NIXE 6-nsec Nd: Glass Laser System. With 10 Figures 61
V. P. Erolov, A. I. Zelnikov and U. Bleyer, Moscow (USSR) and Potsdam-Babelsberg: Charged Rotating Black Hole from Five Dimensional Point of View 371
F. Gackstatter, Berlin (West): On the Deflection of Light in Schwarzschild-Space. With 2 Figures 89
F. Gackstatter, Berlin (West): On Defects of the Volume and Curvature of the Robertson-Walker-Metric and Construction of Cosmological Models 423

E. Ganssauge, Marburg: The Experimental Status of the Anomalon Research. With 36 Figures 202
N. D. Sen Gupta, Bombay (India): Linear Motion under Constant Force and Radiation Reaction ... 503
J. Haase, Leipzig: Composite Pulses in Nuclear Magnetic Resonance. With 4 Figures ... 507
H. Haferkorn, Ilmenau: Apodization for Diffraction Limited Image of the Axial Point by Rotational Symmetric Optical Systems. With 2 Figures ... 133
H. J. Haubold and A. M. Mathai, Potsdam-Babelsberg and Quebec (Canada): Analytical Results Connecting Stellar Structure Parameters and Neutrino Fluxes ... 103
H. J. Haubold, J. P. Mücket and A. Tornambé, Potsdam-Babelsberg and Frascati (Italy): On the Cosmological Origin of Population III Objects ... 519
J. Herrmann, Jena: Condensate Structure of the Vacuum of Quantum Chromodynamics ... 345
S. Ikeda, Tokyo (Japan): On the Theory of Gravitational Field in Finsler Spaces ... 558
G. Jetschke, Jena: Systems with Hysteresis in an Extremely Slowly Fluctuating Environment. With 5 Figures ... 584
R. W. John, Potsdam: The Hadamard Construction of Green's Functions on a Curved Space-Time with Symmetries ... 531
D. Y. Kim, Regina (Canada): On Internucleon Interaction of Composite Nucleon. With 2 Figures 563
H. Kleinert, Berlin (West): Gravity as a Theory of Defects in a Crystal with only Second Gradient Elasticity ... 117
N. P. Klepikov, Moscow (USSR): Uniqueness Theorem for the Relativistic Center of a System of Events ... 313
W. Krech and M. Riedel, Jena: Synchronization Effects in Arrays of Two Josephson Junctions with Finite McCumber Parameter. With 5 Figures ... 329
I. Kulikov and P. Pronin, Moscow (USSR): Topology and Fermionic Condensate ... 100
I. Madzgalla, K.-E. Süsse and D.-G. Welsch, Jena: Anharmonic Effects in Radiationless Vibronic Energy Relaxation. With 2 Figures ... 249
M. N. Mahanta and Y. K. Gupta, Roorkee (India): Coupled Maxwell-Pseudoscalar Field from the Einstein-Mayer Theory ... 553
R. Mańka and J. Kuczyński, Katowice (Poland): The Variational Approach to the Scalar Field Theory in Curved Einstein Space ... 258
V. Müller and H.-J. Schmidt, Potsdam: Power Asymptotes of Homogeneous Cosmological Models in Einstein's Theory of Gravitation ... 545
K. Murawski, Lublin (Poland): On Construction and Solution of the Fifth-Order Korteweg-de Vries Equation ... 593
O. Nachtmann and H.-J. Pirner, Heidelberg: Color Conductivity at High Resolution: A New Phenomenon of Nuclear Physics. With 21 Figures ... 13
L. Oetken, Potsdam: Photodetachment of Electrons Compounded to Excited Hydrogen Atoms as Source of Absorption Features in Magnetic Stars? ... 597
A. Osman and S. Ramadan, Cairo (Egypt): Dependence of the Three-Nucleon Binding Energy on Some Different Effects ... 612
R. V. Popić, Belgrade (Yugoslavia): On the Origin of Spacetime Distribution of Quasars. I. The Simplest Model. With 1 Figure ... 440
R. V. Popic, Belgrade (Yugoslavia): On the Origin of Spacetime Distribution of Quasars. II. The Modified Model. With 2 Figures ... 447
M. Psimopoulos, London (U.K.): On the Direct Generation of Electricity from Heat in Plasmas via a Self-Organization Process ... 455
M. Renninger, Marburg: The Lorentz Transformation as an Expression of Opposite Spacetime Relations. Abandonment of the Principle of Relativity. With 1 Figure ... 378
G. Richter, Berlin: On Newton's Earth-Moon-Test of 1665/66. With 4 Figures ... 176
R. Rompe, P. A. Thiessen, H.-J. Treder, Berlin and Potsdam-Babelsberg: The Meaning and Abilities of Theoretical Physics ... 161
R. Rompe, H.-J. Treder, Berlin and Potsdam-Babelsberg: Newton's "Principia Mathematica Philosophia" and Planck's Elementary Constants ... 153
K. Scharnhorst, D. Robaschik and E. Wieczorek, Berlin, Leipzig and Zeuthen: Quantum Field Theoretic Treatment of the Casimir Effect at $T > 0$. With 1 Figure ... 351

H. Scheurich, Valsolda (Italy): Principles of Quaternionic Vacuum Thermodynamics and a Unified Gravistrong Interaction Model 473
J. Schmelzer, F. Schweitzer, Rostock: On the Kinetic Description of Condensation in Binary Vapours. With 6 Figures 283
H.-J. Schmidt, Potsdam-Babelsberg: On Static Asymptotically Flat Solutions of Fourth Order Gravitational Field Equations 361
H.-G. Schöpf, Dresden: Newton's Theory of the Velocity of Sound. With 1 Figure 198
M. Schubert, Jena: The Attributes of Nonclassical Light and their Mutual Relationship 53
P. Šeba, Prague (Czechoslovakia): A Remark about the Point Interaction in One Dimension . 323
O. Thümmel, Greifswald: Oscillations in the Determination of Renyi Dimension. With 9 Figures 601
H.-J. Treder, Caputh: Hermiticity and Gauge Invariance 137
H.-G. Walther, Jena: Photoacoustic Measurement of Absorption in an Ensemble of Close-Packed Absorbing Spheres. With 4 Figures 305

Short Communications

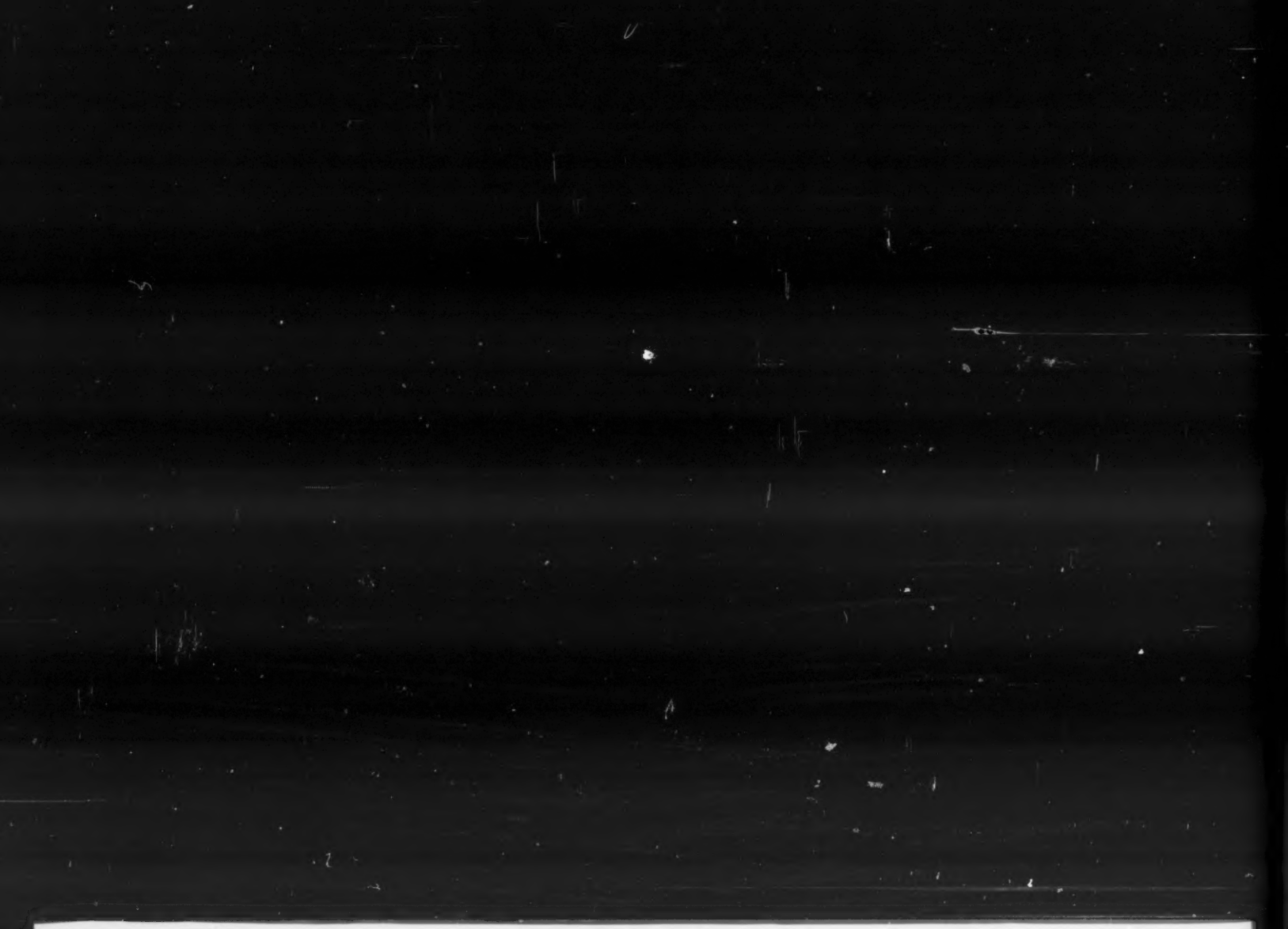
F. M. Sayed Ahmed, M. S. Krim and M. Salama, Cairo (Egypt): A Pseudo Empirical Energy Albedo Formula for the Calculation for the Fast Neutron Reflection from a Concrete Shield with Different Curvatures. With 2 Figures 627
H. Fuchs, Potsdam-Babelsberg: A General Form of the Equations of Motion for Test Particles with Internal Structure 471
Ø. Grøn, Oslo (Norway): Gyroscope Precession and the Principle of Equivalence 391
K. Murawski, Lublin (Poland): On Lax's Formula and Inverse Scattering Method for the Fifth-Order Korteweg-de Vries Equation 625
K. Murawski, J. Kukiełka and R. Koper, Lublin (Poland): On Burgers Equation for a Wave Propagation in One-Dimensional Ideal Gas 468
H. Oleak, Potsdam-Babelsberg: Remark on the Inflationary Universe Generated by Bulk Viscosity 74
G. Ruben, Potsdam: Rotation of Cosmos from Aberration of Quasars. With 1 Figure 150
M. Salama, Cairo (Egypt): Thermal Total Neutron Cross Section of Phosphorus. With 2 Figures 630
A. Voigt, Witten-Rüdinghausen (FRG): A Non-Relativistic Theory, Especially of Mass 76
Ch. Zylka, Leipzig: On the Problem of Attainability of States. With 1 Figure 247

Corrigendum

O. Henkel, W. Pompe and P. Ziesche, Dresden: Contributions of Solid State Physics to the Development of a Theoretically Founded Materials Science 80

Index for Volume 43 625

Annalen der Physik
Verlag Johann Ambrosius Barth, Salomonstraße 18b, Leipzig, DDR-7010; Ruf 70131
Verlagsdirektor: K. Wiecke
Chefredakteur: Prof. Dr. Dr. h.c. mult. H.-J. Treder, Rosa-Luxemburg-Str. 17a, Potsdam-Babelsberg, DDR-1502
Veröffentlicht unter der Lizenznummer 1396 des Presseamtes beim Vorsitzenden des Ministerrates der Deutschen Demokratischen Republik
Satz, Druck und Einband: VEB Druckhaus Köthen, Köthen, DDR-4370
AN (EDV) 51216 AN-ZV 1118000435
8mal jährlich
Jahresbezugspreis DDR 06800 Ausland DM 132,—
Einzelheft DDR 00850 Ausland DM 16,50



Sachregister

7. Folge, Band 44

Cosmology

Kaluza-Klein Cosmology: Friedmann Models with Phenomenological Matter. Bleyer, U., D.-E. Liebscher. **44** (1987) 81.

Charged Rotating Black Hole from Five Dimensional Point of View. Frolov, V. P., A. I. Zelnikov, and U. Bleyer. **44** (1987) 371.

On Defects of the Volume and Curvature of the Robertson-Walker-Metric and Construction of Cosmological Models. Gackstatter, F. **44** (1987) 423.

Power Asymptotes of Homogeneous Cosmological Models in Einstein's Theory of Gravitation. Müller, V., and H.-J. Schmidt. **44** (1987) 545.

Remark on the Inflationary Universe Generated by Bulk Viscosity. Oleak, H. **44** (1987) 76.

On the Origin of Spacetime Distribution of Quasars. I. The Simplest Model. With 1 Figure. Popić, R. V. **44** (1987) 440.

On the Origin of Spacetime Distribution of Quasars. II. The Modified Model. With 2 Figures. Popić, R. V. **44** (1987) 447.

Rotation of Cosmos from Aberration of Quasars. With 1 Figure. Ruben, G. **44** (1987) 150.

Defects in Crystals

Gravity as a Theory of Defects in a Crystal with only Second Gradient Elasticity. Kleinert, H. **44** (1987) 117.

Elementary Particles

The Experimental Status of the Anomalon Research. With 36 Figures. Ganssauge, E. **44** (1987) 202.

General Physics

Newton's "Principia Mathematica Philosophia" and Planck's Elementary Constants. Rompe, R. H.-J. Treder. **44** (1987) 153.

The Meaning and Abilities of Theoretical Physics. Rompe, R., P. A. Thiessen, and H.-J. Treder. **44** (1987) 161.

Newton's Theory of the Velocity of Sound. With 1 Figure. Schöpf, H.-G. **44** (1987) 198.

General Relativity

A Rule for the Equilibrium of Forces in the Hermitian Theory of Relativity. Antoci, S. **44** (1987) 127.

A Method for Finding Solutions of the Hermitian Theory of Relativity which Depend on Three Coordinates. Antoci, S. **44** (1987) 297.

Gauge Fields in General Parametrical Approach and their Finslerian Reduction. Asanov, G. S. **44** (1987) 1.

Covariant Principle of Variation in the Theory of Gravitation. Burghardt, R. **44** (1987) 340.

A General Form of the Equations of Motion for Test Particles with Internal Structure. Fuchs, H. **44** (1987) 471.

On the Deflection of Light in Schwarzschild-Space. With 2 Figures. Gackstatter, F. **44** (1987) 89.

On the Theory of Gravitational Field in Finsler Spaces. Ikeda, S. **44** (1987) 558.

The Hadamard Construction of Green's Functions on a Curved Space-Time with Symmetries. John, R. W. **44** (1987) 531.

Topology and Fermionic Condensate. KULIKOV, I., and PRONIN, P. 44 (1987) 100.
Coupled Maxwell-Pseudoscalar Field from the Einstein-Mayer Theory. MAHANTA, M. N., and Y. K. GUPTA. 44 (1987) 553.
The Variational Approach to the Scalar Field Theory in Curved Einstein Space. MAŃKA, R., and J. KUCZYŃSKI. 44 (1987) 258.
Principles of Quaternionic Vacuum Thermodynamics and a Unified Gravistrong Interaction Model. SCHEURICH, H. 44 (1987) 473.
On Static Asymptotically Flat Solutions of Fourth Order Gravitational Field Equations. SCHMIDT, H.-J. 44 (1987) 361.
Hermiticity and Gauge Invariance. TREDER, H.-J. 44 (1987) 137.

Josephson Effect

Synchronization Effects in Arrays of Two Josephson Junctions with Finite McCumber Parameter. With 5 Figures. KRECH, W., and M. RIEDEL. 44 (1987) 329.

Kinetic Theory

Relationship between Thermodynamic Efficiency and Rate of Microbial Growth Aimed at Optimization of Microbial Growth. With 2 Figures. BAUMANN, F., B. HEINRITZ, and M. RINGPFEIL. 44 (1987) 300.
On the Kinetic Description of Condensation in Binary Vapours. With 6 Figures. SCHMELZER, J., and F. SCHWEITZER. 44 (1987) 283.

Laser

Investigation of X-Ray Emission from Plasmas Created by NIXE 6-nsec Nd: Glass Laser System. With 10 Figures. FÖRSTER, E., K. GOETZ, D. ZIMMER, P. GLAS, A. GOETSCH, R. KOCH, M. NAUMANN, P. V. NICKLES, M. SCHNURER, and I. WILL. 44 (1987) 61.

Mathematical Methods in Physics

A Class of Solutions of Non-Linear Evolution Equations with Diffusion. ENDERS, P. 44 (1987) 514.
On Burgers Equation for a Wave Propagation in One-Dimensional Ideal Gas. MURAWSKI, K., J. KUKIELKA and R. KOPER. 44 (1987) 468.
A Remark about the Point Interaction in One Dimension. ŠEBA, P. 44 (1987) 323.

Neutron Optics

Neutron Interference: Influence of the Mirror on the Spin. AUDRETSCH, J. and C. LÄMMERZAHL. 44 (1987) 145.
A Pseudo Empirical Energy Albedo Formula for the Calculation for the Fast Neutron Reflection from a Concrete Shield with Different Curvatures. With 2 Figures. SAYED AHMED, F. M., M. S. KRIM and M. SALAMA. 44 (1987) 627.

NMR

Composite Pulses in Nuclear Magnetic Resonance. With 4 Figures. HAASE, J. 44 (1987) 507.

Nonlinear Optics

Description of Pulse Propagation in Optical Strip Waveguides by the Generalized Nonlinear Schrödinger Equation. With 1 Figure. FICHHORN, H. 44 (1987) 120.
The Attributes of Nonclassical Light and their Mutual Relationship. SCHUBERT, M. 44 (1987) 53.

Nuclear Physics

On Internucleon Interaction of Composite Nucleon. With 2 Figures. KIM, D. Y. **44** (1987) 563.
Color Conductivity at High Resolution: A New Phenomenon of Nuclear Physics. With 21 Figures. NACHTMANN, O. and H.-J. PIRNER. **44** (1987) 13.
Dependence of the Three-Nucleon Binding Energy on Some Different Effects. OSMAN, A. and S. RAMADAN. **44** (1987) 612.
Thermal Total Neutron Cross Section of Phosphorus. With 2 Figures. SALAMA, M. **44** (1987) 630.

Optics

Scattering of Electromagnetic Bulk Waves from Rough Surfaces with Anisotropic Autocorrelation Function. With 2 Figures. ARNZ, M. and H.-E. PONATH. **44** (1987) 493.
Apodization for Diffraction Limited Image of the Axial Point by Rotational Symmetric Optical Systems. With 2 Figures. HAFERKORN, H. **44** (1987) 133.
Photoacoustic Measurement of Absorption in an Ensemble of Close-Packed Absorbing Spheres. With 4 Figures. WALTHER, H.-G. **44** (1987) 305.

Photon Emission and Adsorption

Electric Dipole Oscillator Strengths and Radiative Lifetimes in the Boron Isoelectronic Sequence. With 2 Figures. EL-SHERBINI, TH. M., A. A. FARRAG, H. M. MANSOUR, A. A. RAHMAN. **44** (1987) 412.
Hartree-Fock Energies of the Doubly Excited States of the Boron Isoelectronic Sequence. EL-SHERBINI, H. M. MANSOUR, A. A. FARRAG and A. A. RAHMAN, **44** (1987) 419.
Anharmonic Effects in Radiationless Vibronic Energy Relaxation. With 2 Figures. MADZGALLA, I., K.-E. SÜSSE and D.-G. WELSCH. **44** (1987) 249.

Planetary Motion

On Newton's Earth-Moon-Test of 1665/66. With 4 Figures. RICHTER, G. **44** (1987) 176.

Plasma Physics

On Self Energy and Vertex Corrections to the Electrical Conductivity of Plasmas. With 4 Figures. BLÜMLEIN, J. and W. D. KRAEFT, **44** (1987) 461.
On the D.C.-Limit of the Electric Conductivity of Plasmas. With 3 Figures. BLÜMLEIN, J. **44** (1987) 524.
On the Direct Generation of Electricity from Heat in Plasmas via a Self-Organization Process. PSIMOPOULOS, M. **44** (1987) 455.

Quantum Chromodynamics

Anomalous Dimensions of Flavour Singlet Light-Cone Operators. BRAUNSCHWEIG, TH., B. GEYER and D. ROBASCHIK. **44** (1987) 403.
Condensate Structure of the Vacuum of Quantum Chromodynamics. HERRMANN, J. **44** (1987) 345.

Quantum Electrodynamics

On the Light-Cone Expansion in Gauge Field Theories (QED). BORDAG, M. and L. KASCHLUHN. **44** (1987) 265.
Quantum Field Theoretic Treatment of the Casimir Effect at $T > 0$. With 1 Figure. SCHARNHORST, K., D. ROBASCHIK and E. WIECZOREK. **44** (1987) 351.
On the Problem of Attianability of States. With 1 Figure. ZYLKA, CH. **44** (1987) 247.

Random and Chaotic Processes

Systems with Hysteresis in an Extremely Slowly Fluctuating Environment. With 5 Figures. JETSCHKE, G. 44 (1987) 584.
Oscillations in the Determination of Renyi Dimension. With 9 Figures. THÜMMEL, O. 44 (1987) 601.

Solitons

Bäcklund Transformation and N-Soliton Solution for the Generalized Nonlinear Schrödinger Equation. EICHHORN, H. 44 (1987) 261.
On Construction and Solution of the Fifth-Order Korteweg-de Vries Equation. MURAWSKI, K. 44 (1987) 593.
On Lax's Formula and Inverse Scattering Method for the Fifth-Order Korteweg-de Vries Equation. MURAWSKI, K. 44 (1987) 625.
On the Bilinearisation Approach to the Soliton Solutions of Cylindrical and Nonlocal K-P Equation. ROY CHOWDHURY, A. 44 (1987) 619.

Special Relativity

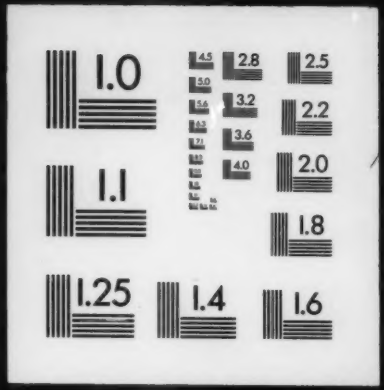
In Favor of a Newtonian Quantum Gravity. DIÓSI, L. and B. LUKÁCS. 44 (1987) 488.
Gyroscope Precession and the Principle of Equivalence. GRØN, Ø. 44 (1987) 391.
Uniqueness Theorem for the Relativistic Center of a System of Events. KLEPIKOV, N. P. 44 (1987) 313.
The Lorentz Transformation as an Expression of Opposite Spacetime Relations. Abandonment of the Principle of Relativity. With 1 Figure. RENNINGER, M. 44 (1987) 378.
Linear Motion under Constant Forces and Radiation Reaction. SEN GUPTA, N. D. 44 (1987) 503.
A Non-Relativistic Theory, Especially of Mass. VOIGT, A. 44 (1987) 76.

Stellar Models

Analytical Results Connecting Stellar Structure Parameters and Neutrino Fluxes. HAUBOLD, H. J. and A. M. MATHAI. 44 (1987) 103.
On the Cosmological Origin of Population III Objects. HAUBOLD, H. J., J. P. MÜCKET and A. TORNAMBÉ. 44 (1987) 519.
Photodeteachment of Electrons Compounded to Excited Hydrogen Atoms as Source of Absorption Features in Magnetic Stars? OETKEN, L. 44 (1987) 597.

Thermodynamics

A Study of the Thermal Hysteresis in $AgNO_3$. With 7 Figures. EL-KABBANY, F., Y. BADR, G. SAID, S. TAHA and S. MAHROUS. 44 (1987) 575.
Entropy Decrease during Excitation of Sustained Oscillations. With 8 Figures. ENGEL-HERBERT, H. and M. SCHUMANN. 44 (1987) 393.


1.0
1.1
1.25
1.4
1.6
2.8
3.2
3.6
4.0
2.5
2.2
2.0
1.8